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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Witzgall

Art Unit: 2674

Serial No.: 09/469,070

Examiner: Abdulselam, A.

Filed: 12/21/1999

Docket No. TI-23879

For: ELECTRO-OPTICAL, TUNABLE, BROADBAND COLOR MODULATOR

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

27 December 2006

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Commissioner for Patents
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Charles A. Brill — 27 Dec 2006

Charles A. Brill — Date

Dear Sir:

The following Appeal Brief is respectfully submitted in connection with the above-identified application in response to the Final Rejection mailed 28 April 2006, and the Advisory Action mailed 14 September 2006. Please charge all required fees, including any extension of time fees, to the deposit account of Texas Instruments Incorporated, Deposit Account No. 20-0668.

REAL PARTY IN INTEREST

The real party in interest is Texas Instruments Incorporated, to whom this application is assigned.

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RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences known to the Applicant's legal representative.

STATUS OF THE CLAIMS

This application was originally filed on 21 December 1999 with ten claims, three of which were written in independent form. Claim 10 was amended on 21 February 2002. Claims 11-13 were added on 17 June 2003. Claim 1 was amended on 22 March 2004. Claims 7, 10, 11, 12, and 13 were amended on 21 February 2006.

Claims 1-13 currently are pending. Claims 1-6 and 10 have been allowed. Claims 7-9 and 11-13 have been finally rejected and are the subject of this appeal.

STATUS OF THE AMENDMENTS

A response after the final rejection was submitted 28 August 2006. This response did not amend and of the claims or the specification.

SUMMARY OF CLAIMED SUBJECT MATTER

Lines 9-18 of page 10 of the specification provide a concise explanation of the invention defined in independent claims 7 and 12. This embodiment of the invention provides a color modulator comprising alternating layers of electrodes 202 and dielectric materials 204 on a substrate 206. The wavelengths that are reflected or transmitted depend on the thickness of each layer and the mismatch in the index of refraction between layers. Changing the index of refraction of the dielectric layers changes the pass band of the color modulator. The refractive index of the electro-optic dielectric coatings is a function of the applied electric field. Therefore, the index of the material and the wavelengths reflected or transmitted are changed by applying a voltage across the dielectric coatings 204.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether Claims 7, 9 and 11 are unpatentable under 35 U.S.C. § 103(a) as obvious over Japanese Publication 10221710 to Taketo *et al.*

2. Whether Claims 8, 12, and 13 are unpatentable under 35 U.S.C. § 103(a) as obvious over Japanese Publication 10221710 to Taketo *et al.* in view of U.S. Patent No. 5,317,429 to Mochizuki *et al.*

ARGUMENT

Ground of Rejection 1:

Claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Japanese Publication No. 10-221710 to Taketo *et al.* ("Taketo"). The applicant respectfully disagrees and submits the Examiner has failed to present a *prima facie* case of obviousness.

"A person shall be entitled to a patent unless," creates an initial presumption of patentability in favor of the applicant. 35 U.S.C. § 102. "We think the precise language of 35 U.S.C. § 102 that, 'a person shall be entitled to a patent unless,' concerning novelty and unobviousness, clearly places a burden of proof on the Patent Office which requires it to produce the factual basis for its rejection of an application under sections 102 and 103, see Graham and Adams." *In re Warner*, 379 F.2d 1011, 1016 (C.C.P.A. 1967) (referencing *Graham v. John Deere Co.*, 383 U.S. 1 (1966) and *United States v. Adams*, 383 U.S. 39 (1966)). "As adapted to *ex parte* procedure, *Graham* is interpreted as continuing to place the 'burden of proof on the Patent Office which requires it to produce the factual basis for its rejection of an application under sections 102 and 103'." *In re Piasecki*, 745 F.2d 1468 (Fed. Cir. 1984) (citing *In re Warner*, 379 F.2d at 1016).

"The prima facie case is a procedural tool which, as used in patent examination (as by courts in general), means not only that the evidence of the prior art would reasonably allow the conclusion the examiner seeks, but also that the prior art compels such a conclusion if the applicant produces no evidence or argument to rebut it." *In re Spada*, 911 F.2d 705, 708 n.3 (Fed. Cir. 1990).

"Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy." *Graham v. Deere*, 383 U.S. 1, 17-18 (1966).

"To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). 'All words in a claim must be considered in judging the patentability of that claim against the prior art.' *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)." MPEP § 2143.03.

"To support the conclusion that the claimed combination is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed combination or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 U.S.P.Q. 972, 973 (Bd. Pat. App. & Inter. 1985).

Claim 7 recites, a color modulator comprising "alternating layers of electrodes and dielectric materials, wherein voltages applied to said electrodes are operable to alter a refractive index of said dielectric material between said electrodes to filter an incident white light beam into a light beam of at least one of at least three colors."

The Examiner stated, "Taketo does not specifically teach voltage being applied to alter a refractive index of the dielectric material between the electrodes with respect to achieving primary colors. However, . . . Taketo teaches setting of dichroic mirrors (27G, 27R, 27B) with respect to dielectric multi-layers and reflected wave length filed such that ZrO2 etc. can be used as a high refractive index film and MgF2 etc. can be used as a low refractive index film and each film is formed with electron beam deposition (see page 8, the first four lines under 'detailed Description')."

The passage referenced by the Examiner states, "It is made, as for 580nm or more and dichroic mirror 27B, for 490-580nm and dichroic mirror 27R to be set . . . to 490nm or less by dichroic mirror 27G. Concretely, ZrO2 can be used as the high refractive-index film, MgF2 etc. can be used as low refractive-index film, respectively, and each film is formed with electron beam vacuum deposition." Thus, Taketo appears to merely state the wavelengths chosen for his three fixed color modulators, and two films vacuum deposited to form the dichroic mirrors.

The passage cited by the Examiner appears to be completely irrelevant to claim limitation "voltages applied to said electrodes are operable to alter a refractive index of said dielectric material between said electrodes to filter an incident white light beam into a light beam of at least one of at least three colors" recited by Claim 7.

The Examiner stated, "Thus it would have been obvious to one of ordinary skill in the art at the time the invention wad made to utilize Taketo's high and low refractive index films with

respect to application of reflected wavelength filed as illustrated in Fig. 1 for the purpose of deriving .the three colored lights (1G, 1R, !B) as taught by Taketo." The applicant respectfully submits that the Examiner has failed to apply the teachings of Taketo to the specific claim limitations recited by Claim 7. Simply alleging that Taketo uses refractive index films to derive color lights does not address the limitations of Claim 7 as required by *Warner, Piasecki, Spada, Royka, Wilson,* and *Clapp* as cited above.

As the Examiner's rejection of Claim 7 as being unpatentable over Taketo is unsupported by the prior art, it should be withdrawn.

Ground of Rejection 2:

Claim 12 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Taketo in view of U.S. Patent No. 5,317,429 to Mochizuki *et al.* ("Mochizuki"). The applicant respectfully disagrees and submits the Examiner has failed to present a *prima facie* case of obviousness.

The Examiner stated, "Taketo teaches a color modulator (see the abstract, light control elements (10G, 10R, 10B)) comprising a substrate; and (see the abstract, a substrate 11 or 12) alternating layers of electrodes and dielectric materials (pixel electrodes, (21, 22), and light control layers (23M, 23 C, 23 Y) which contain dielectric multilayer film) wherein voltages applied to said electrodes are operable to filter an incident white beam of at least one of at least three colors (see the abstract, light control layers (23M, 23C, 23 Y) also contain dichroic mirrors (27G, 27R and 27B) whose reflection wavelength regions are made of respective green red and blue. Also see under 'Detailed description', page 9, 71st and 72nd paragraphs)."

Figure 1 of Taketo, to which the Examiner refers, illustrates three light control elements (10G, 10R, and 10B). Each light control element includes a chiral nematic liquid crystal containing a dichroic dystuff (23M, 23C, and 23Y) sandwiched between transparent electrodes

(21 and 22). Outside the electrode pair is a dichroic mirror (27G, 27R, 27B). Taketo appears to function by absorbing some wavelengths of incident light using the dyestuff and selectively blocking the non-absorbed wavelengths by operating the liquid crystal cell. Each dichroic mirror reflects a particular fixed set of wavelengths of light.

The Examiner stated, "Taketo does not teach dielectric material being selected from the group consisting of LiNbO3, LiTaO3, NH4H2PO4, KH2PO4 and CdTe. Mochizuki on the other hand teaches a cladding layer, which may be any material whose refractive index can be changed by the electro-optical effect and is, for example, a ferroelectric substance such as LiNbO3 (col. 4, lines 43-50)."

Thus, the Examiner's proposed combination apparently would replace the fixed dichroic mirror elements (27G, 27R, 27B) of Taketo with an electronically controlled cladding layer from Mochizuki. The applicant respectfully submits that the Examiner's proposed modification would not appear to function as the dichroic mirrors of Taketo are outside the transparent electrodes of each of the light control elements of Taketo and presumably would not be controlled by the field generated between the electrodes.

The applicant respectfully submits the Examiner has failed to show the references expressly or impliedly suggest the claimed combination, or "present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references" as required by *Clapp*.

The Examiner further stated, "It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Taketo' display system shown in Drawing 1, to adapt Mochizuki's layer, LiNbO3 as a dielectric layer because the use of the layer, LiNbO3 helps function a liquid crystal display device as taught by Mochizuki (col. 6, lines 5-20)." This

is simply a conclusory statement by the Examiner, rather than a teaching or suggestion of the prior art.

Taketo teaches a reflection type color display device (title) while Mochizuki teaches an optical switching device utilizing coherent light (abstract). As Taketo's device is designed to provide a color display using outdoor daylight incidence (see, e.g. paragraph 0043 of Taketo), while Mochizuki switches coherent light (abstract), the applicant respectfully submits the two references should not be combinable.

As the references should not combinable and the examiner has failed to show the references expressly or impliedly suggest the claimed combination, or "present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references" as required by *Clapp*, the Examiner has failed to present a *prima facie* case of obviousness under 35 U.S.C. § 103(a) and the rejection therefore is defective and should be withdrawn.

CONCLUSION

For the foregoing reasons, Appellants respectfully submit that the Examiner's final rejection of Claims 7-9 and 11-13 is improper, and it is respectfully requested that the Board of Patent Appeals and Interferences so find and reverse the Examiner's rejection.

Please charge any fees necessary in connection with the filing of this paper, including any necessary extension of time fees, to Deposit Account No. 20-0668 of Texas Instruments Incorporated.

Respectfully submitted,

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CLAIMS APPENDIX

1. (Previously presented) A color display system comprising:

a light source for providing a beam of white light along a light path;

at least one color modulator on said light path, said color modulator comprised of a stack of at least two dielectric layers and at least three transparent electrode layers, wherein a voltage applied to said electrodes limits the wavelengths of light permitted to continue on said light path;

a controller;

a spatial light modulator on said light path, said spatial light modulator operable to selectively modulate incident light in response to signals from said controller; and

projection optics on said light path operable to focus light from said spatial light modulator on an image plane.

2. (Original) The display system of Claim 1, further comprising a prism assembly for spatially separating an illumination segment of said light path from a projection segment of said light path, said spatial light modulator located at a junction between said illumination segment and said projection segment.

3. (Original) The display system of Claim 2, wherein said color modulator is fabricated on a face of said prism assembly.

4. (Original) The display system of Claim 1, wherein said color modulator is fabricated on said spatial light modulator.

5. (Original) The display system of Claim 1, wherein said spatial light modulator is a deformable mirror device.

6. (Original) The display system of Claim 1, wherein said spatial light modulator is a liquid

crystal device.

7. (Previously presented) A color modulator comprising:

a substrate; and

alternating layers of electrodes and dielectric materials, wherein voltages applied to said electrodes are operable to alter a refractive index of said dielectric material between said electrodes to filter an incident white light beam into a light beam of at least one of at least three colors.

8. (Original) The color modulator of Claim 7, wherein said dielectric material are selected from the group consisting of, $LiNbO_3$, $LiTaO_3$, $NH_4H_2PO_4$, KH_2PO_4, and CdTe.

9. (Original) The color modulator of Claim 7, said electrodes formed of Indium Tin Oxide.

10. (Previously presented) A method of creating a full-color image, the method comprising the steps of:

providing a beam of white light;

filtering said beam of white light to produce a primary color beam of light, said filtering step performed by passing said beam of white light through a stack of at least two dielectric layers, at least one of said dielectric layers exposed to an electric field;

selectively modulating portions of said primary color beam of light to produce an image-bearing beam of light; and

focusing said image-bearing beam of light on an image plane; and

altering electrical signals biasing said stack of dielectric layers such that said primary color beam of light alternates between at least three colors.

11. (Previously presented) The color modulator of Claim 7, wherein said voltages applied to

said electrodes are operable to filter an incident white light beam into a light beam sequentially comprised of at least three colors.

12. (Previously presented) A color modulator comprising:

a substrate; and

alternating layers of electrodes and dielectric materials, wherein voltages applied to said electrodes are operable to filter an incident white light beam into a light beam comprised of at least one of at least three colors, wherein said dielectric material are selected from the group consisting of, $LiNbO_3$, $LiTaO_3$, $NH_4H_2PO_4$, KH_2PO_4, and CdTe.

13. (Previously presented) The color modulator of Claim 12, said electrodes formed of Indium Tin Oxide.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.